Dear Alumni and Friends of the Department of Geological Sciences:

It’s hard to believe that another year has passed – but I am happy to say that the Department is in a much better and brighter position than it was last spring. Due to the heroic efforts of our faculty and students, together with overwhelming support from our alumni and friends, we not only survived the draconian cuts that were proposed for the Department as a consequence of the ongoing fiscal crisis in the State (and University System), but we are now thriving. As often occurs in perilous times, people rise to meet the threats before them, join together, and find ways to succeed when it appears the odds are against them. I am proud to say that with your help we did just that. During the past year we have made major strides toward increasing the number of undergraduate majors (greater than 50 percent increase), offering new classes and a new degree track, graduating more undergraduate majors and doctoral students, and having much success in our research endeavors in the State and around the world.

Details of many of our activities, research and awards are presented in this issue along with some of the events that occurred this past year and those we are planning for the next year. I am glad to say that we have a terrific group of undergraduate majors who are excited about learning and have been successful in recruiting new Geology majors. They have also created an organization known as the “Geologic Sciences Ambassadors” (they even have their own logo and polo shirts) who together with the “Geogators” (an organization of graduate students who volunteer in the local school system) have given fourteen presentations to local school children about Earth and our environment. In collaboration with the Department of Geography we have developed a joint degree program know as the Environmental Geoscience track for those undergraduate students interested in pursuing the variety of careers dealing with the Environment, but not necessarily going on for an advanced degree in Geology or Geography.

A number of our graduate students have been very successful this year as indicated by national recognition for their research by the American Geophysical Union, offers of well-paying jobs in industry, and prestigious post-doctoral appointments at institutions such as Cambridge University, Scripps Institution of Oceanography, Oregon State University and Woods Hole Oceanographic Institution. We wish them all the best of luck in their careers.

Most of our students and faculty played some role in our successful “Can You Dig It” geo-expo event at the Florida Museum of Natural History again this year. More than 2,000 excited and energetic children, parents and interested members of the community came to see our exhibits and interactive displays explaining everything from earthquakes and tectonics to volcanoes and meteorites. A tip of the hat goes to Matt Smith, who did most of the organizing for the event and provided some explosive volcanic activity that was a major crowd pleaser.

Our faculty members have also had a banner year. Members of the Department were awarded nearly $3M in new grants this past year and more than 95 percent of the faculty now have research funding. Ellen Martin and Mark Brenner were promoted to Full Professor rank, Ray Russo was promoted to Associate Professor and received tenure, Ray Thomas was promoted to Associate In Geology and Jason...
In April 2009, John (PhD 2002) and Claire Grimm (BS Geology, 2002) Chadwick had a baby boy named Benjamin. John is currently an assistant professor in the Department of Geography and Earth Sciences at the University of North Carolina at Charlotte. He can be reached at djchadw@uncg.edu.

Department Offers New Bachelor of Arts Degree in Environmental Geosciences

Faculty members of the departments of Geological Sciences and Geography have combined their expertise to design a new cross-disciplinary Bachelor of Arts degree. The Bachelor of Arts in Environmental Geosciences is intended for students interested in land and water aspects of the environment. The focus is on geological resources such as water and mineral resource exploitation and management, geological hazards, environmental planning, resource sustainability, or earth science education.

Students who choose this major will take basic courses in both geology and geography. These majors will complete upper level coursework in both disciplines but can choose to focus their major concentration on either Geological Sciences or Geography. The major requires a total of 39 to 44 credit hours.

Undergraduates who are interested in pursuing the new Bachelor of Arts in Environmental Geosciences are urged to contact Dr. Joseph Meert, Geological Sciences Undergraduate Coordinator, at jmeert@ufl.edu, or call the department at 352-392-2231.

From the Department Chair... (continued from page one)

Curtis was promoted to the rank of Senior Associate In Geology. I am proud to say that three of the eleven distinguished Term Professors in the entire College this year were from our department and include Liz Screaton, Ellen Martin and David Foster. Liz Screaton was also elected as the Chair of the United States Advisory Committee (USAC) for Scientific Ocean Drilling; the national advisory committee for U.S. participation in the Integrated Ocean Drilling Program (IODP) and wider issues in scientific ocean drilling. Congratulations to Joe Meert, who was honored as a Fellow of the Geological Society of America this spring.

In order to help the Department better serve the needs of our students and alumni, the private sector, and our profession in general, we created a Geological Sciences Advisory Committee primarily consisting of alumni from the Department but also including supporters from local industry, DuPont and ExxonMobil. Our first organizational meeting took place at UF in November and we plan to hold another one before school starts again in late August.

More good news came our way last fall when the Department was given one of only 13 new faculty positions in the College. We had an excellent group of applicants from which to choose an expert in “climate and global change” and I am happy to say that we were successful in obtaining our number one candidate. Dr. Andrea Dutton Lambeck, who is currently a Research Fellow at the Australian National University and who earned her PhD from the University of Michigan, will be joining us (with her family) beginning next January. We are all looking forward to her arrival and welcome the addition of her expertise to our marine geological and climate change research programs, as well as her involvement in the new Climate Institute that is taking shape at UF. Looking forward we hope to search for a world-class scientist to fill an Endowed Chair that has been created by two of our biggest supporters: Jon and Beverly Thompson. The plan is for this Chair to specialize in subsurface geology and develop a Center for Florida Geology. Down the road we also hope to hire a planetary geologist as part of a State Space-related Initiative grant we were awarded as part of a joint program with University of Central Florida.

We plan to host a Geology Alumni “event” during this year’s Homecoming so keep October 16th open on your calendars. We would love to see a large contingent of geologists here. I hope you enjoy this issue of the Rocky Gator and will send us comments and news about what you have been doing. As always, we appreciate all the support you provide to keep our educational programs healthy and vibrant.

I hope to see you here this fall,

Michael Perfit
Florida Ridges’ Mystery Marine Fossils Tied to Rising Land, Not Seas

By Aaron Hoover
University of Florida News Desk

Sea level has not been as high as the distinctive ridges that run down the length of Florida for millions of years. Yet recently deposited marine fossils abound in the ridges’ sands.

Now, a University of Florida geologist may have helped crack that mystery.

In a paper appearing June 1 in the June edition of the journal Geology, Peter Adams, a UF assistant professor of geological sciences, says his computer models of Florida’s changing land mass support this theory: The land that forms the sandy Trail Ridge running north to south through South Georgia, as well as lesser-known ridges, was undersea at the time the fossils were deposited—but rose over time, reaching elevations that exceeded later sea level high stands.

“If you look at the best records, there’s no evidence that global sea level has come close to occupying the elevation of these fossils since the time of their emplacement,” Adams said, referring to Trail Ridge’s elevation today, nearly 230 feet above modern sea level. “The only thing that explains this conundrum is that Trail Ridge was under-water, but later rose to an elevation higher than subsequent sea levels.”

At the heart of the phenomenon are Florida’s unique weather patterns and geology, Adams said.

The state’s abundant rain contains a small amount of carbon dioxide, which forms carbonic acid in lake and river water. This slightly acidic water slowly eats away at Florida’s limestone bedrock, forming the karst topography for which Florida is so well known, replete with pockmarks, underground springs and subterranean caverns. The surface water washes the dissolved limestone out to sea, over time significantly lightening the portion of the Earth’s crust that covers Florida.

A mass of slow-moving mantle rock resides 6 to 18 miles below the crust. As the Florida land mass lightens, this mantle pushes upward to equilibrate the load, forcing Florida skyward, Adams said. The process is known as isostatic rebound, or isostatic uplift.

“It’s just like what happens when you get out of bed in the morning. The mattress springs raise the surface of the bed back up,” Adams said, adding that the uplift is similar to what takes place when glaciers retreat, with Maine and Norway, for example, also gaining elevation.

Glaciers melt off the land surface to drive isostatic uplift. But in Florida, varying rainfall rates during different periods have slowed or quickened the karstification just below the land. This has in turn slowed or quickened the mantle’s push up from below. Additionally, sea level high stands do not always return to the same elevation, which creates a complex history of which beach ridges are preserved and which aren’t, Adams said.

For instance, during periods when sea level rose quickly, some pre-existing ridges were overtaken and wiped out. During other periods, however, when sea level rose slowly or did not reach a certain ridge’s elevation, a beach ridge was preserved. In effect, Trail Ridge, Lake Wales Ridge and other lesser-known ridges are the remains of isostatically uplifted land that was kept out of harm’s way, Adams said. The ridges carry with them the marine fossils that are the evidence of their slowly low beginnings.

Today, the land surface of Florida is rising at a rate of about one-twentieth of a millimeter annually, far more slowly than sea level rise estimated at approximately 3 millimeters annually. Adams noted that Florida’s rise is not nearly rapid enough to counteract sea level rise—and that society should be mindful that low-lying coastal areas are threatened.

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UF Geological Sciences Celebrated the End of the 2009-2010 Academic Year with Awards, Food, Drink and Music

The 2009-2010 Geological Sciences student awards were presented at the “End of the Year Student Awards/Mystery Meat Raffle/Day After Earth Day Party” held at Dr. Andrew Zimmermann’s house on April 23rd. Open to all faculty, affiliates, alumni, graduate and undergraduate students and their families, the gathering has turned into an annual event.

PhD candidate Dorsey Wanless was given this year’s Horn Award. The Horn Award goes to one graduate student who has excelled in eagerness, inspiration, involvement in and contribution to the geology department, academic ability and research activity during their total graduate career at UF.

Recent PhD graduate Chuang Xuan won the John Ridge Award for academic achievement in the geological sciences during his graduate career in both class work and research (publishing and presentations).

MS students Allen Kent and Katherine Malone were each given the Ernst Award as outstanding teaching assistants in GLY 1000 and 2000 level courses and GLY 3000 level and above courses, respectively.

The Danker Award for outstanding graduating undergraduate went to Ashley Machek. Ashley excelled in scholarship, enthusiasm, motivation, leadership and involvement in the department during her total undergraduate career as a geology major.

Picture top left: (from left to right) undergraduates Lalitha Christian, Carolyn Ball and Ciro Luysterburg; top right: PhD candidate Derrick Newkirk played grillmaster and provided the mystery meat; above: (from left to right) undergraduate Caleb Rhatigan, MS student Brittany Newstead, Ana Bremner and MS student Paul Bremner; and below: a gathering of faculty, students, and families watch the awards presentations.
The Eades Award for Environmental Geology Studies went to undergraduate major Carolyn Ball. In honor of James Eades, the award is given to the graduate or undergraduate student who has shown the most commitment to excellence studying in class or in investigating environmental geology, broadly defined as all surficial processes.

Recent MS graduate Julie Mathis won the Nichol Paleontology Award (in honor of Dave Nichol), which is given to the graduate or undergraduate student who has shown the most commitment to excellence studying in class or investigating paleontological topics.

The Estwing Award, voted on by peers, faculty and teaching assistants, went to recent BS graduate Osvaldo Meireles. The Estwing prize -- a geological hammer provided by the Estwing Company each year -- is given to the best field camp student.

Thanks to the barbecuing skills of PhD candidate Derrick Newkirk, everyone who attended ate really well. Following the awards ceremony, a raffle was held for the identity of the mystery meat. PhD student Susanna Blair and MS student Aldo Rincon won with their guesses of elk, though many thought the mystery meat sure tasted like ostrich.

The partying went on into the evening, with a blazing bonfire and live music provided by assorted faculty and students.

*Picture top left: (from right to left) Dr. Andrew Zimmerman and Dr. Peter Adams present Ashley Machek with her Danker Award certificate; top right: Dr. Zimmerman and Dr. Adams explain award criteria; above: (from right to left) Dr. Andrew Zimmerman and Dr. Peter Adams present Carolyn Ball with her Eades Award certificate; below left: (from left to right) undergraduate Nicole Cundiff and MS student Brittany Newstead listen as MS student Alex Ullrich, Dr. Andrew Zimmerman and Dr. Matt Smith play on; and below right: PhD candidate Alex Hastings and MS student Kate Rowe.*
Brenner’s Student Studies Snails

Limnologist/paleolimnologist Mark Brenner studies physical, chemical, and biological aspects of lakes. During a visit to Highlands County, Florida a few years ago, he found large numbers of exotic South American island apple snails (Pomacea insularum) in two water bodies. There are concerns that the invasive mollusks may out-compete native apple snails, consume large amounts of aquatic vegetation, and create feeding challenges for juvenile snail kites (birds). Unfortunately, little is known about the life history of the exotic organism. One of Brenner’s graduate students, Tom Arnold (pictured below), is measuring stable oxygen isotope ratios along the growth axis of the snail shells to determine how long the animals live and how rapidly they grow in Florida. This study is an excellent example of how geologic methods help solve environmental problems.

UF Professor to Help Gauge Future Earthquake Possibilities

By Ron Wayne
University of Florida News Desk

A University of Florida geophysics professor will help to deploy and operate up to 100 high-sensitivity earthquake recorders into the Chile earthquake zone for the next six months.

Ray Russo and Steve Roecker, a seismologist at Rensselaer Polytechnic Institute, will lead a team representing the IRIS Consortium, a group of about 200 U.S. universities and research institutions. Funded by the National Science Foundation, the team expects to visit the site several times over the next six months.

The team hopes to determine the extent and nature of the fault that slipped on February 27 to gain insight into how adjacent segments of the Nazca-South America plate boundary might behave in the next few decades, UF’s Russo said. Many seismologists believe the recent earthquake increases the likelihood of a large-magnitude earthquake either to the north or south of the recent rupture, he added.

“Studying the earthquake rupture zone is of paramount importance because earthquakes along the western coast of South America tend to repeatedly rupture the same areas at intervals of decades or even centuries, and it is unclear why the ruptures occur only on segments of the fault during a given quake, rather than the whole fault slipping at the same time,” he said.

Russo, who has a doctorate in seismology and geophysics from Northwestern University, has been an assistant professor of geophysics in UF’s department of geological sciences since 2004. He studies the flow of the Earth’s mantle and its relation to global surface tectonics.

Russo can be reached at 352-392-6766, or at rrusso@ufl.edu.

Graphic (at right) depicts the broadband seismometers and accelerometers installed in the rupture region of the 2010 Chile earthquake. More information about the ongoing research can be found at http://www.iris.edu/hq/chile/.

Florida Ridges’ Mystery … (continued from page three)

Neil Opdyke, a UF professor emeritus and a co-author of the recent paper, first proposed the uplift process in a 1984 paper. Adams tested it using computer models that matched known information about sea levels dating back 1.6 million years with historic rainfall patterns, karstification rates and mantle uplift. The models concluded that Trail Ridge is approximately 1.4 million years old -- and has been preserved because of uplift and the fact that sea levels have not reached the ridge’s elevation since its formation. In addition, Florida’s one-twentieth of a millimeter rise is twice as fast as previously thought.

“The neat thing about this paper is, it combines many different systems that people work on. There are people who work on uplift, people who work on erosion of karst, people who work on precipitation and paleoclimate,” Adams said. “And I knew just enough about all these things to be dangerous. So I said, ‘Let’s take what we know from the literature and put it together in a simple mathematical model to see how the whole system responds.’”
Marine Geologist Available to Talk About Research into Rising Sea Levels

By Kristin Bowe
University of Florida News Desk

University of Florida marine geologist John Jaeger joined a team of more than 30 scientists on a nine-week drilling excursion off the coast of New Zealand to explore the global concern for rising sea levels.

Scientists from around the world gathered to participate in the Integrated Ocean Drilling Program’s Canterbury Basin Sea Level Expedition 317. The goal of the expedition that ended in January was to observe how sea level has changed during the past 30 million years. The Canterbury Basin was chosen for its strong oceanic water signals and high-resolution temporal record of sea level change.

Over the last 40 years, sea level has risen at rates 50 percent faster than current climate change models predicted, and by 2100 sea levels may be over 20 inches higher than they are now, Jaeger said.

Rising sea level impacts more than just the shoreline position. Higher sea levels lead to more frequent coastal flooding and greater invasion of seawater into freshwater coastal aquifers, a huge impact for a state like Florida where large population centers such as Miami are found right on the coast and get most of their drinking water from such aquifers, he said.

According to Jaeger, more than 600 million people worldwide live in low elevation coastal zones, areas that are less than 30 feet above sea level. Many of the large cities and barrier islands in Florida fall within this zone, putting these areas in danger for flooding.

Jaeger said the ability to better understand the causes and magnitudes of sea level changes is one of the key components of climate change research.

“It was a once-in-a-lifetime opportunity for any marine geologist who studies the long-term impacts of changing sea level,” said Jaeger.

The expedition included several record accomplishments for scientific ocean drilling. He said drilling with a dynamically positioned drillship has historically been a challenge in the relatively shallow waters of continental shelves, the seaward continuation of coastlines. The expedition reached record drilling depths of more than half a mile, or 3,400 feet, on the continental shelf and more than 1.2 miles on the nearby continental slope, becoming the deepest hole drilled on a single expedition in the history of scientific ocean drilling. It was also the deepest sample taken by scientific ocean drilling for microbiological studies at 6,300 feet.

“Together, these record-setting accomplishments will allow for an unprecedented scientific view of million-year long changes in global sea-level, the paleoclimate history of an understudied part of the Earth and of the environmental limits of life on this planet,” he said.

The Canterbury expedition was one of four expeditions. Other expeditions occurred near New Jersey, the Bahamas, Tahiti and Australia.

Jaeger can be reached at 352-846-1381 or jmjaeger@ufl.edu.

Again and Again . . .

Our Grads Prove to Be the Best of the Best!

Kudos to Chuang Xuan, who received the outstanding paper award at the 2009 American Geological Union fall meeting in San Francisco this past December. Xuan received his PhD in Spring 2010 and is considering several postdoctoral positions on the west coast.

PhD candidate Dorsey Wanless (pictured above) was honored by the Volcanology, Geochemistry and Petrology (VGP) section of the American Geological Union during the fall 2009 AGU meeting. Dorsey’s presentation was identified as one of the best by first-author students at the VGP sessions. There were a total of 425 first-author student presentations and the winners comprised just 3 percent of all evaluated presentations.
The Department Retreated to the Forest

On January 26, 2010 we held a full-day faculty retreat at UF’s Austin Cary Forest conference center. The retreat gave us the opportunity to seriously discuss some of the directions the Department will take in the next few years and do some strategic planning for the future. Most active faculty and staff members were able to attend. UF professional facilitator John Dane led participants in exercises designed to detail “where we as a department are trying to go and how we intend to get there.” It was a productive and enjoyable day that provided us with ideas for some new and exciting educational avenues to follow.

Department of Geological Sciences Faculty: (standing, from left to right) Ray Thomas, Dr. James E.T. Channell, Dr. Michael Perfit, Dr. Mark Brenner, Dr. Matt Smith, Dr. Paul Mueller, Dr. Neil Opdyke, Dr. Mark Panning, Dr. Ellen Martin, Dr. Ray Russo, Dr. Joseph Meert, Dr. Jim Vogl, Dr. John Jaeger; (sitting/kneeling, from left to right) Dr. Kyle Min, Dr. Jason Curtis, Dr. David Foster, Dr. Elizabeth Soreton, Dr. Andrew Zimmerman, Dr. George Kamenov, Dr. Peter Adams, and Dr. Ann Heatherington. Not available for faculty picture: Dr. Paul Ciesielski, Dr. Kainan Huang, Dr. Jonathan Martin, Dr. Guerry McClellan and Dow Van Arnam.

Vic Ricchezza (BS Geology, 1999), Earth Systems Teacher in the Science Department at Langston Hughes High School, Fairburn, GA: “This year I left my position as Senior Geologist with Airtek Environmental Corp. (Long Island City, NY) and accepted a position as a science teacher with the brand new Langston Hughes High School in Fulton County, Georgia (just outside Atlanta). I’m teaching a class in Earth Systems which involves a synthesis of geology, oceanography, and meteorology, and preparing high school students to pass the science portion of the Georgia High School Graduation Test. Although I very much enjoyed my nine-year career as an environmental field geologist, I feel I’ve found a calling for myself as a geology teacher. I can be reached through the school (Vic Ricchezza, Langston Hughes High School, 7510 Hall Road, Fairburn, GA 30213, or via email at ricchezza@fultonschools.org). Go Gators!”

Let Us Know What’s Happening

The Rocky Gator relies on information from you. Did you get promoted or win any awards recently? Did you move to a new job or city? Get married? Have a child? Or can you tell us about another Rocky Gator with whom you’re in contact? Let us know what’s happening by mailing or e-mailing us the information—with photos if possible—to:

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